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Observations Based on an Experience with Nearly One Thousand Cases of Typhoid Fever.

Read before the Section of Practice of Medicine at the Forty-fourth
Annual Meeting of the American Medical Association.

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OBSERVATIONS BASED ON AN EXPERIENCE WITH NEARLY ONE THOUSAND CASES OF TYPHOID FEVER.

BY JAMES B. HERRICK, M.D.
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Within the past five years I have seen in the city of Chicago, in Cook County, Presbyterian and St. Elizabeth Hospitals and in private practice, nearly one thousand cases of typhoid fever.

The following observations are based on the experience with these cases:

Observations the result of clinical experience are accepted as true by the reader, only so far as the facts accord with those he himself has noted, or as the conclusions appeal to his reason, or as he has confidence in the ability of the observer to make accurate observations and correctly to interpret them. I fully realize the truth of the Hippocratic motto Professor Osler has put at the head of his book, "Experience is fallacious and judgment difficult," and I am aware of the weak points in a paper clinical in character, not experimental nor even statistical. And I fear lest what I write may seem trite and commonplace, for I am daily made conscious that much that is being put in type concerning the clinical side of typhoid fever is really but the restatement, though often from a different standpoint, of facts old, known to our predecessors, and often plainly set down in words in works now regarded as out of date. I have repeatedly been

surprised, not to say chagrined, to find that some fact new to me, and that came to me with the pleasurable freshness of a genuine discovery, was a fact already noted by previous observers.

It has been my aim in preparing this paper to touch only those points of unusual interest, because of the rarity of the clinical phenomena, or because current literature, or discussion among medical men, seems to betray variety of opinion concerning those matters, or what has seemed at times a wrong conception of them.

Circulatory System. The pulse of typhoid is a *slow* pulse, and this notwithstanding a high temperature. I could show many history sheets where the pulse never reached one hundred, while the temperature ranged from 103° to 105.5° . The average in women is higher by five to fifteen beats to the minute than in men. A pulse of ninety in a bed-patient, with a temperature of 103° , should be regarded as a diagnostic feature in favor of typhoid. A pulse of over one hundred and six in a male with typhoid is one needing most careful watching. And above all, a pulse that is, especially in the first two weeks, to-day one hundred, to-morrow one hundred and four, then one hundred and ten, one hundred and sixteen, etc., is one of bad omen.¹ The disproportion between pulse and temperature is, I believe, as characteristic of typhoid as is the rapid pulse of scarlet fever. Liebermeister lays great stress upon this point, and says that of those with a pulse as high as 140, 50% die; over 140, 80%; over 150, 90%. The compressibility of the pulse, its frequent dicrotism and occasional intermittent character, have been repeatedly noted. Bradycardia is a common phenomenon of convalescence; but, on the contrary, many a patient whose pulse has never exceeded one hundred while in bed and who, as apyrexia has been reached,

¹ Chantemesse, quoting Malherbe and Parizot, says the period of cardiac weakness begins at one hundred and twenty beats to the minute and that the pulse of the fastigium oscillates between 80 and 104 in men and 104 and 120 in women. *Traité de Médecine*, I—p. 756.

has had a pulse rate of only fifty or sixty has, on first getting out of bed, had the pulse jump to one hundred and twenty or one hundred and forty. The pathological basis of this irritable heart may be in myocardial degeneration. One of the County Hospital typhoids who left contrary to orders, after the temperature had been normal for only one week, on arriving home and after climbing two flights of stairs, fell suddenly dead. No autopsy was permitted. The existence of this cardiac irritability during convalescence carries its own lesson of enforced quiet during this period.

It has seemed to me that the absolute rest that has been insisted upon, together with the naturally low arterial tension and slow heart beat, especially as convalescence approaches, might account for the large number of cases of femoral thrombosis met with. In private practice I have seen it in five per cent. of cases in adults, never in children. In the Presbyterian Hospital last fall about one in ten had thrombosis. Murchison is authority for the statement that it occurs usually in only one per cent. of cases. No serious consequences have followed this complication beyond the persistence, often for months, of oedema of the affected limb, whenever the limb was for any length of time in a dependent position. I have never seen pulmonary embolism in consequence of femoral thrombosis. No veins other than the femoral or its radicals have been affected.

Arterial obstruction by thrombus or embolus has not been met with in any of these cases.

Twice during convalescence an increase of temperature, pulse one hundred and twenty to one hundred and fifty, distinct endocardial murmur where none previously existed, in one case, praecordial pain, have given evidence of the rather rare complication, acute endocarditis. In one case there were, inside of a week, subsidence of temperature, reduction in pulse-rate, and almost total disappear-

ance of murmur. In the other, the patient, at the end of four weeks in bed, left the hospital with rapid heart and mitral systolic murmur.

Skin. In my experience sweating is not usually present until late in the disease, that is, a sweating not produced by antipyretics. The statements of authors are here at variance; for instance, Pepper stating that sweating is more common in typhoid fever than in almost any other of the acute diseases, except malaria, relapsing fever and rheumatism.²

The papular rose-colored eruption has been present in the great majority of cases, yet absent in many. Eichhorst's one thousand consecutive cases with rash in every case is an unique record. It has seemed to me that where the papules were very abundant the patient was always very sick. On the contrary their scantiness, or absence, was no evidence of a light case. In only one case have I noticed the eruption on the face. In this instance it covered the arms and legs as well, and persisted, appearing in successive crops for over four weeks. I do not remember to have seen labial herpes in typhoid. The "peliomata" or "taches bleuâtres" I have seen but once. Body lice were found in this case. Bed-sores have been rare, owing to careful nursing. The only circumstances under which a bed-sore in a patient properly nursed can possibly be excusable and be looked upon as other than a blunder, as Dr. Henry calls it, is where an intestinal hemorrhage demands, for a time, absolute quiet of the patient. The skin over the sacrum kept moist by the oozing, bloody stool will become rapidly necrotic under a few hours pressure. One of the cases of acute endocarditis, above referred to, occurred in a patient with an unhealed suppurating bed-sore; I regard this as the infection atrium. The daily sponge bath with soap and water and also with alcohol, *i. e.*, the keeping of the skin as aseptic as possible, is I believe, responsible for the

² An American Text-book on Theory and Practice of Medicine; Vol. I, p. 70.

very few cases of furunculosis I have seen. I can recall but one case and that of moderate severity.

Respiratory Tract. Epistaxis has been an early phenomenon in about 20 per cent. of cases. It was seen, not infrequently, in influenza, yet by no means as often as in typhoid. Severe epistaxis during the height of the disease, such as to cause evidence of acute anemia and to call for radical treatment, I have met with twice.

Laryngeal ulceration has not been carefully sought for. In one case only has laryngeal perichondritis occurred. This was in a lad of seventeen and during convalescence from an unusually severe typhoid. A laryngeal ulcer, detected by the laryngoscope, probably gave to the bacteria admission to the deeper tissues resulting in the suppurative perichondrial inflammation. The patient recovered under tracheotomy, though he nearly died later by the closure of the tube through plugs arising from a fibrinous bronchitis. I do not know of any other instance of perichondritis in either the Presbyterian or County Hospitals during five years. Dr. E. Fletcher Ingals, whose counsel in this case was of great value to me, tells me that in twenty years experience as a laryngologist he has seen but one other instance of perichondritis arising during typhoid. Hölscher reports fifteen cases among 2,000 fatal ones.

Bronchitis has been of such frequent occurrence as to be regarded rather in the light of one of the pathological accompaniments of the disease, than as a complication. Its extent and severity, however, in some instances have made it a source of danger, and obscured the diagnosis. Once a case I regarded as miliary tuberculosis arising during typhoid, or perhaps, such from the beginning, made a complete recovery and compelled a return to the original diagnosis. And once in consultation, remembering this case, I was enabled rightly to reverse the diagnosis of tuberculosis back to typhoid.

Pneumonia has been very rare, at least rarely

recognized clinically and *post-mortem*. Its insidious onset, the absence of chill, additional temperature, cough and rusty sputa, make us fall back on rapidity of respiration and physical signs as diagnostic data and rapidity of respiration is by no means a reliable sign. Many cases are probably due to the streptococcus, possibly the bacillus typhosus, and not to the diplococcus of Fraenkel. I believe the stern insistence upon strict cleanliness of the mouth and nose is responsible for the small number of cases of pneumonia and severe bronchitis I have seen. Air inhaled through a foul nose, mouth and pharynx carries to bronchi and alveoli numerous bacteria that excite irritation, if not specific inflammation. Inhalation of bronchitis and pneumonia I have aimed to avoid by oral cleanliness, and by insisting that the patient should be made often to change the position from one side to the other, and to the back, and lately by instructions to have him take several times daily, full and deep inspirations. By these procedures fewer organisms enter the respiratory tract, there is less passive congestion of any one part, mucus tends less to accumulate in any one portion of the bronchi or alveoli, and it is more readily dislodged by the cough excited by the deep inspiratory effort.

Fever. The highest temperature observed was 106° axillary. This was in a child of ten years who had been given, by visitors, cake and candy. The mild course of the disease seemed from this time on to be aggravated, delirium, involuntary discharges, rapid emaciation following with continuance of unusually high temperature. Recovery followed. In another case, in private practice, a colored woman of forty, who varied her liquid diet by occasionally indulging in crackers, meat, peanuts and popcorn, and whom I could not induce to go to the hospital, and who spent nearly one-third of her time out of bed, I found twice a temperature of 106°. Three days after a normal evening temperature had

been reached, she was up, weak and trembling to be sure, but doing a fair day's work at the ironing table. Her boy of ten years with a typical typhoid was, during his illness, never in bed for any one twenty-four hours, and never undressed. He recovered. In several cases temperatures have been prevented, I think, from passing 106° by antipyretic measures.

I have become strongly impressed with the great tenacity with which the fever in the early days, say the first twelve days, will cling to the high points in spite of our efforts to make it let go its hold. Again and again nurses have told me, with despairing faces, how after half an hour's sponging, the temperature has actually gone up instead of down. And, during the early days larger doses of antipyretics are required to produce an appreciable effect on the body heat. In the third week the fever is much more tractable. The five grains of phenacetin that on the ninth day barely reduced a temperature of 105° to 104° , will on the fifteenth cause a drop from 105° to 100° , or even to subnormal. I have learned to be extremely cautious in giving even moderate doses of these drugs in the third and fourth weeks of the disease. Seldom do I give more than three grains of phenacetin or two grains of acetanilid at such a time. The sponge bath at this time will usually reduce temperature without difficulty.

Prolongation of temperature when all evidence of typhoid is past, *i. e.*, when the bowels are regular, rose spots and tympany have disappeared, tongue is moist and spleen apparently normal in size, and where no demonstrable complication is present, is a very perplexing condition whose pathological cause cannot in all cases be explained. Catarrhal inflammation of the small intestines, ptomaine absorption, nervous influences, post-typhoid anemia, may explain some cases. Unrecognized inflammation of the mesenteric glands may exist. Twice have I finally found a serous pleuritic exudate, trifling in amount, which I thought explained the temperature.

Lately I have, in this class of cases, commenced a cautious use of solid food, in spite of evening temperatures of 100° or 101° , have, a few times, allowed the patients to get out of bed, and had gratifying results. The nervous excitement is allayed, the condition of the blood improved, and as strength returns from the additional nourishment, the causes keeping up the temperature seem to vanish. The pleural exudate in the two cases referred to, disappeared under light diet.

I certainly believe that errors in diet may be the cause of inducing not only a recrudescence but a genuine relapse. I have never seen more than two genuine relapses in one patient, the entire duration of the fever being seventy-seven days. Several times I have seen what was apparently a reinfection occur before the temperature had reached normal.

Mild cases have been common. Apyretic typhoid I diagnosticated once on the basis of exclusion of other diseases, prevalence of typhoid, mental dullness, physical weakness, condition of tongue, enlarged spleen and slightly tympanitic abdomen, as well as by the fact of gradual improvement at the end of three weeks. Two other cases in the County Hospital, though not in my service, have been diagnosed as apyretic typhoid. One of these recovered. The second came to autopsy and typhoid fever lesions were found. This latter case must convince even the skeptical of the actual existence at times of typhoid infection without fever.

Of so-called abortive cases, or rapid cases, those that run their pyrexial course in from ten to twenty days, I have seen several, and especially in children. In one boy of five years, rose-spots, delirium, diarrhœa, subsultus with typical temperature, going as high as 105° , make the diagnosis of typhoid unequivocally sure. Yet on the sixteenth day there was no fever, nor other evident relic of the disease.

Alimentary. The tongue gives to me much less evidence in making up a diagnosis, than in forming

a prognosis. Only once have I seen a pharyngeal ulcer, and in this case on the uvula and extending slightly over to the soft palate.

In two cases parotid abscess has formed. Strict cleanliness of the mouth preventing so far as possible severe stomatitis and infection of the parotid by way of Steno's duct is the best prophylactic against suppurative parotitis, as it is one of the preventive measures against bronchitis and pneumonia, and middle ear suppuration. One case of parotid abscess was in a patient who came under my care on the tenth day of her illness, and who was in circumstances such that no nursing that ought to go by that name, was obtainable. She had, without exception, the filthiest mouth I ever saw in a typhoid.

In several cases vomiting has been so prominent early in the disease as to obscure diagnosis, by drawing attention to the stomach. It usually subsides in a few days. Vomiting late in typhoid has rarely been met with, and always excites suspicions of over-medication or over-feeding. Diarrhœa has not been present in more than half the patients, and then usually appearing in the second week. Patients with diarrhœa are sicker than the constipated.

Hemorrhage has occurred oftenest in cases attended by diarrhœa. I have never seen any benefit follow these hemorrhages, but on the contrary have too often seen death follow, once even in an hour, after the first appearance of blood, or later after the repeated recurrence.

Tympanites I seldom meet with, now that I use from the beginning some intestinal antiseptic, usually salol. Certainly its occurrence to such an extent as to be regarded as a complication is a rarity compared with its rather frequent manifestation four years ago.

It is a mistake to expect sudden, sharp pain whenever intestinal perforation occurs. In some cases pain has been so marked as to cause the nurse to hurry for the house physician, with her diagnosis

of perforation. But I have seen three cases where the patient, with perception not even ordinarily blunted by the disease, has had no sensation of sudden pain, made little complaint of pain save on rather violent manipulation of the distended abdomen. Autopsy in one case enabled me to make the diagnosis, in the other two it confirmed the ante-mortem diagnosis. Loss of liver dullness, especially if shortly before the dullness had been present, is a valuable sign, though not infallible.

Urine. Retention has several times necessitated catheterization. In a few instances a mild cystitis followed. Nephro-typhoid has been rare. Albuminuria has been common. Ehrlich's test has been frequently applied. Dr. A. R. Edwards,³ then interne at the County Hospital, made a careful examination of the urine of one hundred and thirty typhoids (not all in my service) and found Ehrlich's reaction in ninety-eight and one-half per cent of the cases. He also found the reaction marked in the urine of tubercular patients, malarial, septicæmic, anemic cases, etc. It is known to be usually present in the urine of measles. Its diagnostic value is, therefore, extremely limited. Its absence speaks with a fair degree of certainty against typhoid, yet it failed me once in a case of typhoid just when I most needed it.

Nervous. I am convinced that under the treatment by intestinal antiseptics there is less delirium than without this method. A great many patients are mentally quite bright throughout the illness. Post-febrile melancholia I have seen twice, and well marked mental weakness once. All three cases recovered. One case of peripheral neuritis was observed in the Presbyterian Hospital last year, the lower extremities being involved. In not a few cases pain has been complained of over the region of the spleen. This I took to be due to a tightly stretched splenic capsule. Pain and hyperæsthesia

³ The Medical News, April 2, 1892.

in the soles of the feet and in the leg, especially over the tibia, have been several times observed during convalescence.

The bellying of the muscle as the biceps on sharply pinching it I seldom fail to find even quite early in the disease. I have found it as well in pneumonia, pulmonary tuberculosis, septicæmia, very rarely in malaria.

I regret my inability to furnish exact figures as to the proportion of cases among new comers to Chicago. In private practice twenty-six per cent. of my patients with typhoid had been in the city less than one year. I am confident that in the County Hospital where foreigners make up a goodly percentage of the inmates, thirty or forty out of every one hundred typhoids were new comers. The large influx of population to Chicago for the past few years, the new comer not possessing immunity against typhoid infection, may explain in a measure the fearful prevalence of this disease during the past five or six years. It has seemed to me that the new resident has been especially liable to a severe form of the disease. Almquist⁴ quotes Murchison as saying that sixteen per cent. of his typhoid patients had not been in London a year. Louis is quoted as noting about the same percentage of new city residents among his typhoids and Almquist thinks in his own practice the same is true. "He who has not been early exposed to the poison," he says, "more easily falls a victim to the same." The frequent occurrence of the disease among medical students coming to Chicago from the country is worthy of note.

The necessity of extreme care in the nursing of typhoids, in the disposal of excreta, etc., has been strongly impressed upon me by the occurrence of a second case in the family in ten instances where the nursing was done by unskilled nurses or by the

⁴ Sammlung Klin. Vorträge, No. 5, 1890. Ueber die Hauptmomente der Etiologie des Abdominal typhus.

members of the family, as well as by the rarity of the appearance of second cases where the services of a careful nurse have been available, and by the very infrequent development of typhoid in the wards of our hospitals where at times in a single ward forty and fifty patients with illnesses other than typhoid have been crowded in among as many typhoids.

TREATMENT.

Rest. The recumbent position in bed has been insisted upon even during mild cases. No patient has been allowed to get up until there has been a normal temperature for at least a week, and in the greater number of cases for a longer time than a week.

Diet. Liquid diet has been ordered, consisting chiefly of milk given at regular intervals every two to four hours, day and night, an adult taking, on an average, three pints during this time. Coffee, chocolate, cocoa, beef-tea, ice cream, egg-albumen water, egg-nog, are allowed to vary the monotony of the milk diet. Light diet is not allowed until there has been a normal evening temperature for from three to five days.

Fever. Sponging has been resorted to in most cases, whenever the temperature reached 103° or 103.5° . Cold, tepid or warm water has been employed, according to the effect upon the individual patient, or his likings. The ice-pack has been occasionally made use of, as has the ice-cap, and ice-coil to the abdomen. The cold bath treatment has not been employed, because circumstances made it unavailable. At times in private practice, and in the hospital where crowded wards made systematic sponging for temperature a physical impossibility for the limited number of nurses, and again in those cases before mentioned, where sponging failed to produce the desired effect, antipyrin, phenacetin, or acetanilid have been given. Since I have learned to be cautious in using these remedies, and to give small

or moderate doses, I have never seen any bad effect. Lowered temperature, slower pulse with firm, full beat, improvement in mental symptoms, free perspiration are the effects usually noted.

Intestines. Salol, ten to twenty grains in twenty-four hours, has been given in almost all of my late cases. Either these cases have been naturally light, or the intestinal antiseptic has modified the course of the disease, so that symptoms of intoxication have been less marked. The mind is clearer, there is less delirium, diarrhœa and tympanites are present only in a trifling degree; prostration and emaciation are comparatively insignificant. An initial dose of calomel has been very frequently administered.

An enema usually of glycerin and water has been regularly administered on alternate days, whenever necessary by reason of constipation. Turpentine for excessive diarrhœa, especially if there be diarrhœa combined with tympanites, has seemed, in cases, of benefit, though for tympany the enema, or use of the rectal tube, is more reliable. I have lately avoided opium unless strongly indicated.

Perforation. Surgery offers the only hope of relief, and from the fact that perforation occurs usually at a time when the patient is poorly able to withstand the shock of beginning peritonitis, let alone that of anæsthesia and operation, the recoveries must necessarily be few. When occurring in a patient not profoundly depressed by the disease, where the diagnosis is made early, and surgical interference is prompt, operation may result in cure. I was privileged to see the case under the care of Drs. Fisher and Van Hook, where the early and accurate diagnosis of the one and the prompt and efficient operation of the other resulted in a brilliant recovery. Of several cases operated on in the Cook County Hospital all have proven fatal. In no case where perforation has been diagnosed before death has there been any evidence of localization of the

resulting peritonitis. General peritonitis and death have always followed.

Circulatory. The loss of four women in as many weeks in the female ward at the County Hospital, where *ante-* and *post-mortem* diagnosis failed to reveal the anatomical lesion of any complicating disease, and where death occurred from sudden failure of the heart and collapse, taught me to give early, before symptoms of cardiac failure begin, some cardiac stimulant. Nux vomica, or strychnia I usually prescribe, often from the start, in small doses, so that the amount can be gradually increased. Alcohol I give much less freely than formerly, reserving it for the class of cases where in the third week we have the patient in the typical typhoid state.

Hemorrhage. I give ergot and acetate of lead usually, opium always. The latter drug even if it have no direct effect upon the circulation, quiets the patient, often restless and anxious from the acute anæmia, and lessens the peristaltic movements of the intestines. Cold is usually applied to the abdomen. The efficacy of treatment, save that of rest and opium, is doubtful.

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